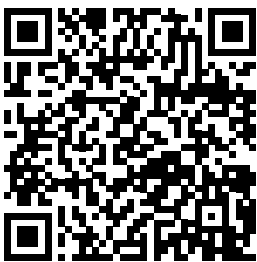




Milli-Temp Series

ADJUSTABLE DEPTH BEARING SENSORS:
4-20 mA OUTPUT



INSTALLATION INSTRUCTIONS

OPERATION MANUAL

Part No. ADBxxMV3AI

www.go4b.co.uk

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CUSTOMER SAFETY RESPONSIBILITIES

4B appreciates your business and is pleased you have chosen our products to meet your needs.

Please read in its entirety and understand the literature accompanying the product before you place the product into service. Please read the safety precautions carefully before operating the product. With each product you purchase from 4B, there are some basic but important safety considerations you must follow to be sure your purchase is permitted to perform its design function and operate properly and safely, giving you many years of reliable service. Please read and understand the Customer Safety Responsibilities listed below. Failure to follow this safety directive and the Operation Manuals and other material furnished or referenced, may result in serious injury or death.

SAFETY NOTICE TO OUR CUSTOMERS

- A. In order to maximize efficiency and safety, selecting the right equipment for each operation is vital. The proper installation of the equipment, and regular maintenance and inspection is equally important in continuing the proper operation and safety of the product. The proper installation and maintenance of all our products is the responsibility of the user unless you have asked 4B to perform these tasks.
- B. All installation and wiring must be in accordance with Local and National Electrical Codes and other standards applicable to your industry. (Please see the article “Hazard Monitoring Equipment Selection, Installation and Maintenance” at www.go4b.com.) The installation of the wiring should be undertaken by an experienced and qualified professional electrician. Failure to correctly wire any product and/or machinery can result in the product or machine failing to operate as intended, and can defeat its design function.
- C. Periodic inspection by a qualified person will help assure your 4B product is performing properly. 4B recommends a documented inspection at least annually and more frequently under high use conditions.
- D. Please see the last page of this manual for all warranty information regarding this product.

CUSTOMER SAFETY RESPONSIBILITIES

1. READ ALL LITERATURE PROVIDED WITH YOUR PRODUCT

Please read all user, instruction and safety manuals to ensure that you understand your product operation and are able to safely and effectively use this product. If the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.

2. YOU BEST UNDERSTAND YOUR NEEDS

Every customer and operation is unique, and only you best know the specific needs and capabilities of your operation. Please call the 24-hour hotline at 309-698-5611 for assistance with any questions about the performance of products purchased from 4B. 4B is happy to discuss product performance with you at any time.

3. SELECT A QUALIFIED AND COMPETENT INSTALLER

Correct installation of the product is important for safety and performance. If you have not asked 4B to perform the installation of the unit on your behalf, it is critical for the safety of your operation and those who may perform work on your operation that you select a qualified and competent electrical installer to undertake the installation. The product must be installed properly to perform its designed functions. The installer should be qualified, trained, and competent to perform the installation in accordance with Local and National Electrical Codes as well as any of your own standards and preventive maintenance requirements, and other product installation information supplied with the product. You should be prepared to provide the installer with all necessary installation information to assist in the installation.

4. ESTABLISH AND FOLLOW A REGULAR MAINTENANCE AND INSPECTION SCHEDULE FOR YOUR 4B PRODUCTS

You should develop a proper maintenance and inspection program to confirm that your system is in good working order at all times. You will be in the best position to determine the appropriate frequency for inspection. Many different factors known to the user will assist you in deciding the frequency of inspection. These factors may include but are not limited to weather conditions; construction work at the facility; hours of operation; animal or insect infestation; and the real-world experience of knowing how your employees perform their jobs. The personnel or person you select to install, operate, maintain, inspect or perform any work whatsoever, should be trained and qualified to perform these important functions. Complete and accurate records of the maintenance and inspection process should be created and retained by you at all times.

5. RETAIN AND REFER TO THE OPERATION MANUAL FOR 4B'S SUGGESTED MAINTENANCE AND INSPECTION RECOMMENDATIONS

As all operations are different, please understand that your specific operation may require additional adjustments in the maintenance and inspection process essential to permit the monitoring device to perform its intended function. Retain the Operation Manual and other important maintenance and service documents provided by 4B and have them readily available for people servicing your 4B equipment. Should you have any questions, please call the free 24-hour hotline number (309-698-5611).

6. SERVICE REQUEST

If you have questions or comments about the operation of your unit or require the unit to be serviced please contact the 4B location who supplied the product or send your request via fax (309-698-5615) or call us via our 24-hour hotline number in the USA (309-698-5611). Please have available product part numbers, serial numbers, and approximate date of installation. In order to assist you, after the product has been placed into service, complete the online product registration section which is accessed via our website www.go4b.com/usa.

! WARNING

- Rotating machinery can cause serious injury or death
- Always lockout and tagout the machine prior to installation

PRODUCT OVERVIEW

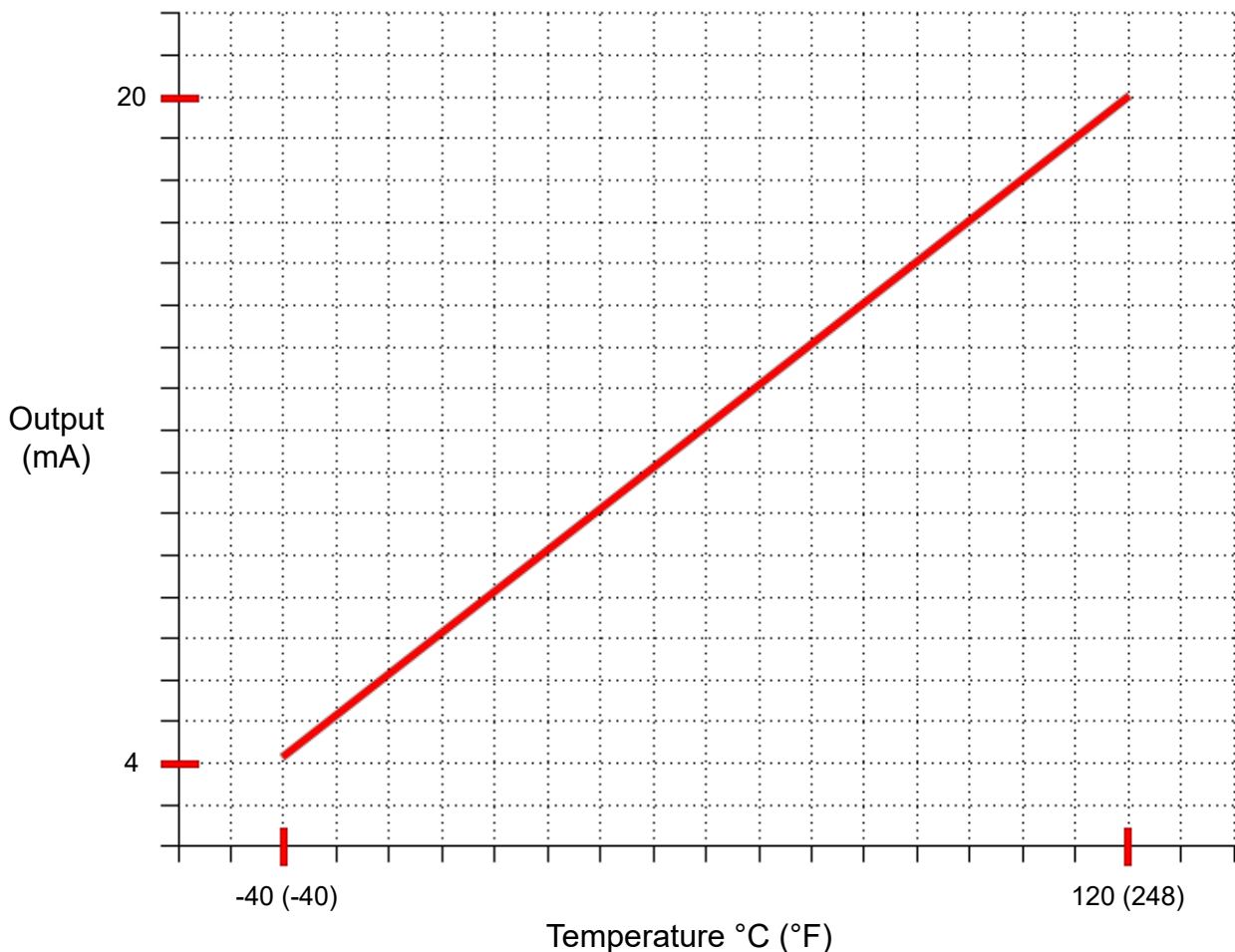
The Milli-Temp series are loop powered sensors with 4-20 mA linear outputs that are scaled across a temperature range (see graph below) for continuous temperature monitoring. The 4-20 mA output allows the sensor to work with PLC / DCS systems (system programming required).

The sensor has been designed to allow the depth of the probe to be adjustable depending on your application. Probes are available in 50, 75, 100, 150 and 200 mm lengths (special order lengths available on request).

The sensor screws directly into a bearing housing through the existing grease zerk thread. Each sensor is fitted with a zerk to allow lubrication of the bearing without the need for removal of the sensor.

The sensor is supplied with a 3 meter cable. The connections are not polarity sensitive therefore special connection requirements are eliminated, and the cable can be extended in the field.

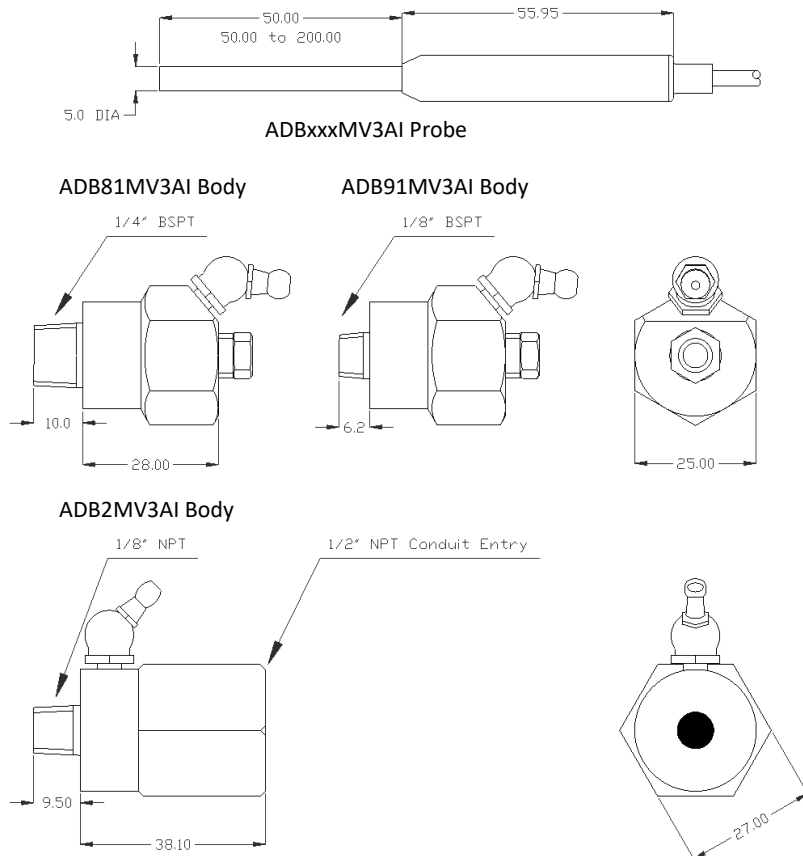
MILLI-TEMP OUTPUT TEMPERATURE SCALE



SPECIFICATIONS

Supply Voltage -	24 VDC Nominal (15 to 28 VDC)
Current at -40° C (-40° F) -	4 mA
Current at 120° C (248° F) -	20 mA
Temperature Accuracy -	Typical $\pm 0.6^{\circ}\text{C}$ (1°F) Over Entire Range $\pm 2.7^{\circ}\text{C}$ (5°F)
Default Temperature Resolution Over Current Loop -	0.05°C (0.09°F)
Operating Temperature (Probe) -	Minimum: -40°C (-40°F) Maximum: 120°C (248°F)
Output Resolution (Typical) -	5 - 10 μA
Current Out of Range -	20.5 mA or < 4 mA
Body/Probe Material -	304 Stainless Steel
Fixing Thread -	ADB81 = 1/4" BSPT, ADB91 = 1/8" BSPT, ADB2 1/8" NPT
Cable -	3 m - 2 Conductor
Approvals -	<p>ATEX: Baseefa09ATEX0231X</p> <p>Ex II 1D Ex ta IIIC T₂₀₀125°C Da IP66 Tamb -40°C to +60°C</p> <p>IECEX: IECEX_BAS_09.0111X</p> <p>Ex ta IIIC T₂₀₀125°C Da IP66 Tamb -40°C to +60°C</p>

DIMENSIONS



**ALL DIMENSIONS
mm UNLESS STATED**

CONDITIONS OF USE

1. The supply circuit of the system where the equipment is connected shall be protected by a suitably rated fuse capable of interrupting a prospective short circuit current of 10kA.
2. The supply to the equipment must not exceed 24V.
3. If the equipment supply leads are terminated in a hazardous area, the termination arrangement must comply with the Zone/Category/required EPL of the hazardous area that it is to be installed.

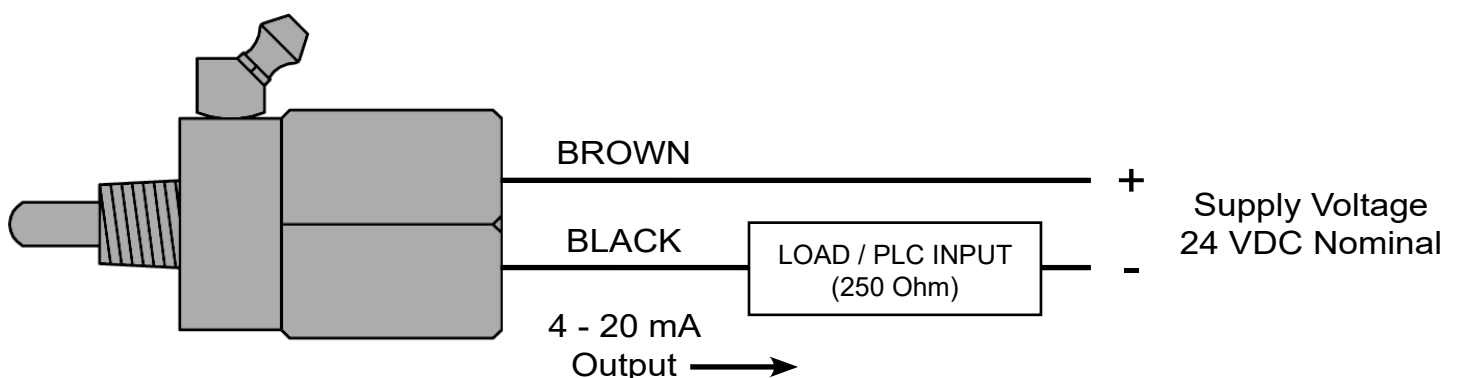
STANDARD WIRING DIAGRAM

All wiring must be in accordance with local and national electrical codes and should be undertaken by an experienced and qualified electrician. All equipment should be properly grounded prior to operation.

Additional wire used during the installation must have a temperature rating of 70° C (158° F) or above, and be at least 24 AWG. 4B recommends using shielded cable to reduce electromagnetic interference (EMI) to maintain signal integrity.

For ADB2MV3AI, always use dust/liquid tight flexible metal conduit with approved fittings to protect the sensor cables. Use rigid metal conduit to protect the cables from the sensors to the control unit. Conduit systems can channel water due to ingress and condensation directly to sensors and sensor connections which over time will adversely affect the performance of the system. As such, the installation of low point conduit drains is recommended for all sensors.

All Milli-Temp sensors are *NOT* polarity sensitive, however 4B recommends wiring the sensors as outlined below.



NOTE

Supply polarity to the Milli-Temp is not important and the load can be connected to either wire. However to reduce the chances of creating short circuits, 4B recommends that wiring consistency be maintained by using the same color scheme throughout the entire installation process.

⚠ WARNING

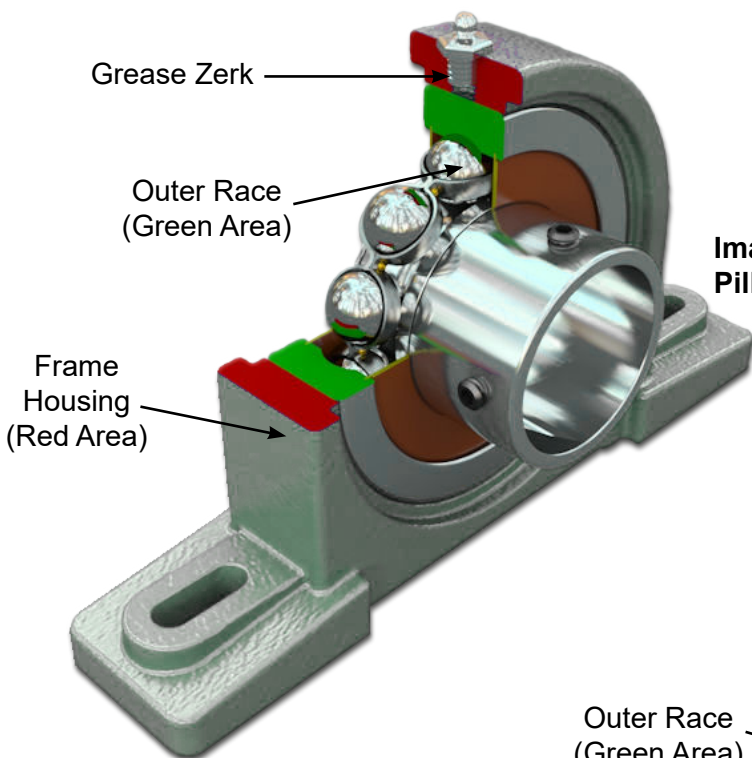
Do not wire the sensor across the voltage source directly. Always ensure that the sensor is wired into a signal conditioning circuit for the temperature measurement. If the power applied across the sensor exceeds the specified maximum rated power or current, the sensor may be damaged beyond repair. When properly wired to 4B controllers, the power rating across the sensors is kept at a safe level.

INSTALLATION

1. Refer to the Standard Wiring Diagram section for proper electrical connections before installing the sensor on the bearing.
2. Remove the existing grease zerk from the bearing housing.
3. Loosen the Milli-Temp probe nut and remove the sensor probe.
4. Screw the Milli-Temp sensor body in to the threaded hole in the bearing housing (making sure the correct thread type is used).
5. Re-insert the temperature probe into sensor body, and adjust the probe depth to suit the bearing. For optimum temperature monitoring, the probe should be as close to the outer race as possible without touching (Images A and B).
6. Tighten the Milli-Temp probe nut using the recommended wrench (ADBW). The maximum recommended torque for the probe nut is 2 Nm (18 in lb).
7. For the ADB2MV3AI use liquid tight flexible conduit and fittings for the installation.

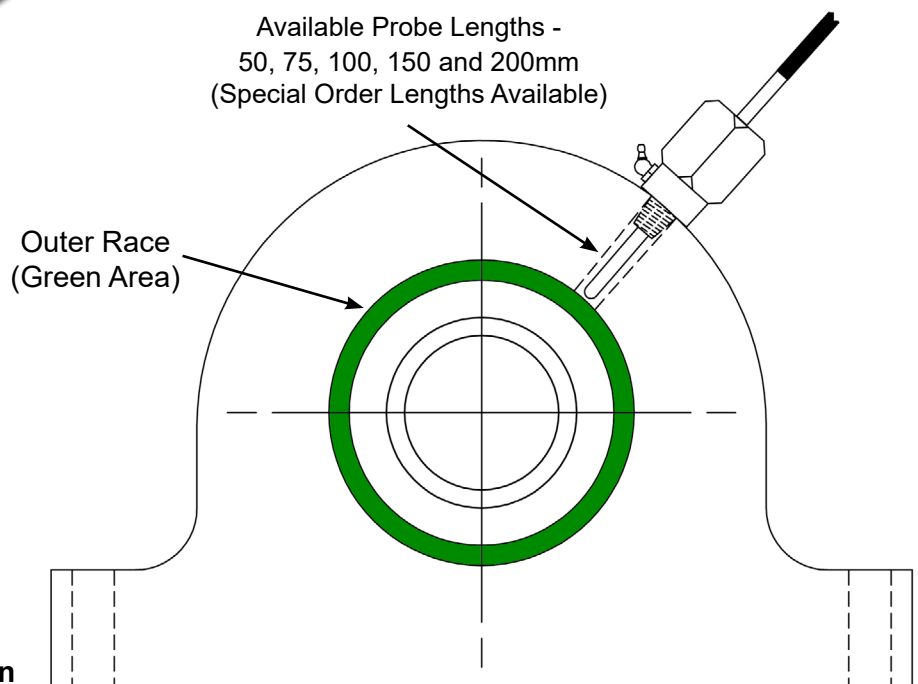


**Probe Wrench
(ADBW)**



**Image A -
Pillow Block Bearing Cutaway**

**Image B -
ADB2MV3AI
Sensor Installation**

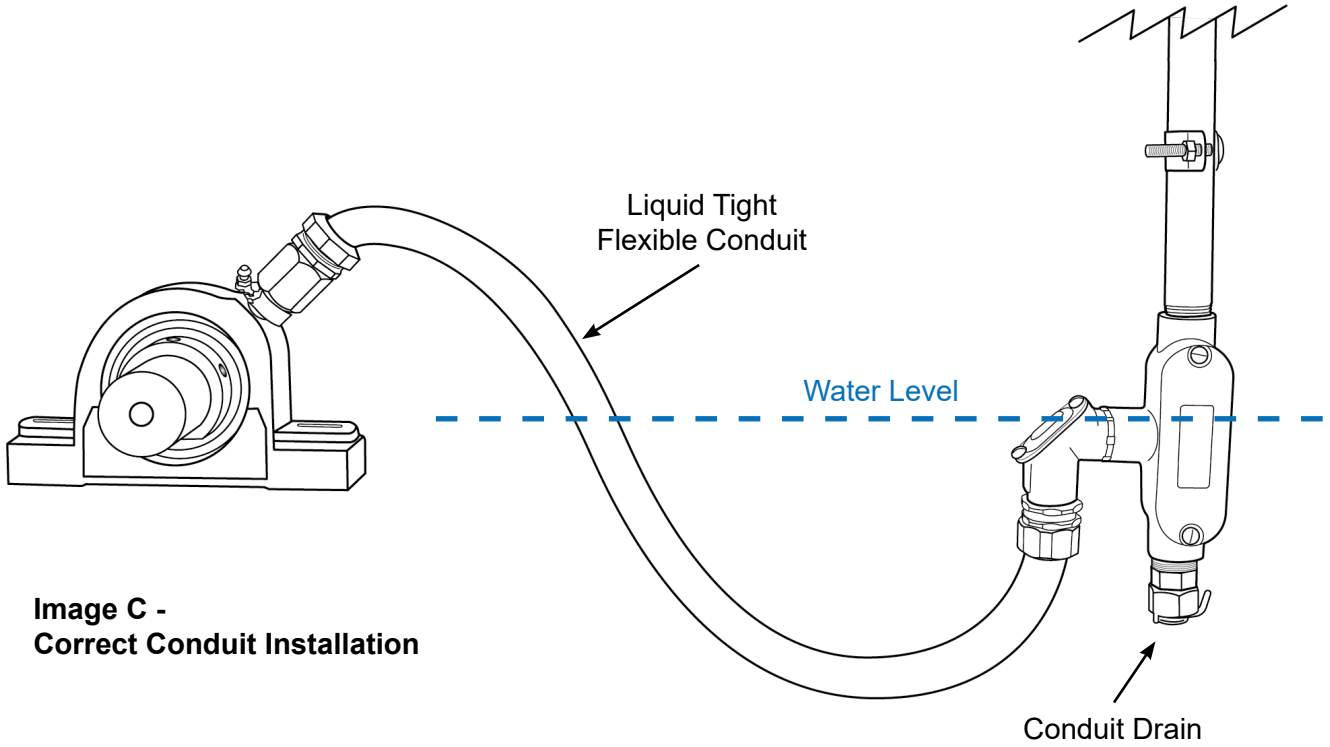


LIQUID TIGHT FLEXIBLE CONDUIT INSTALLATION -

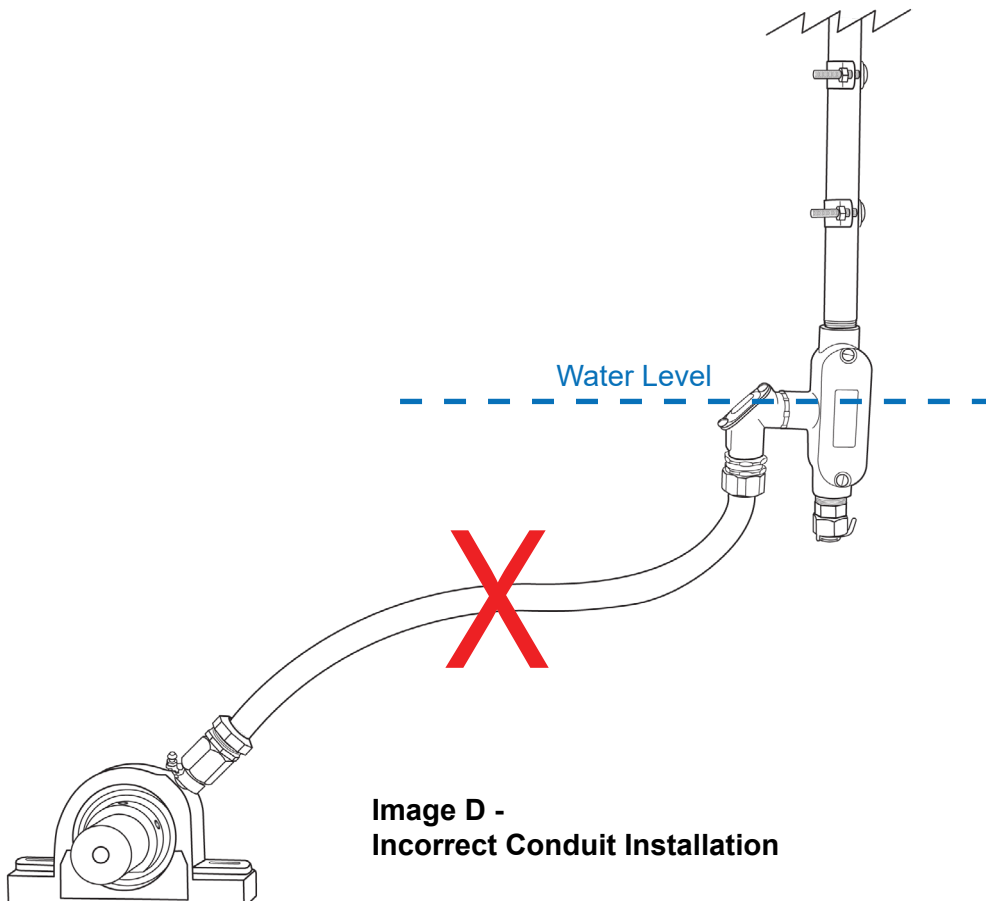
Conduit systems can channel water directly to sensors from incorrectly sealed fittings and condensation. Over time, water will adversely affect sensor performance. To prevent this type of damage, it is important to properly install conduit and low point conduit drains. Use rigid metal conduit to protect the cables from the sensors to the control unit.

Image C illustrates the correct installation of liquid tight flexible conduit. Notice that the bearing sensor is above the conduit drain and the water level.

Image D shows that water, particularly condensation, can bypass the conduit drain and flow directly into the sensor.



**Image C -
Correct Conduit Installation**



**Image D -
Incorrect Conduit Installation**

TESTING & COMMISSIONING

1. Check that the unit is correctly installed.
2. 4B's ADB Sensor Tester can be used as a diagnostic tool to verify the alarm and shutdown sequences of the control unit are functioning as expected.
3. Contact 4B for any questions regarding installation issues if sensor does not perform as expected.



ADB Sensor Tester

The ADB Sensor Tester has been designed to test 4B adjustable depth bearing temperature sensors in the field. This hand held test unit features an integrated heating block specifically designed to have a 4B Milli-Temp sensor directly inserted. With integral controls and temperature display, the unit heats the sensor to the desired trip point, and allows quick and easy real life testing of the sensor and temperature monitoring system.

During planned maintenance or periodic testing, the ADB Sensor Tester can be used as a diagnostic tool to verify the alarm and shutdown sequences of the control unit are functioning as expected. To test, the heater block should be set above the control units alarm operating temperature. Remove the Milli-Temp bearing sensor probe from the housing and insert it into the heater block. As the heater block reaches the alarm temperature, the Milli-Temp sensor will relay this data to the control unit, allowing you to verify that the alarm and shutdown sequences run as expected. When testing is complete, reinstall the probe back into the bearing housing.



WARNING

If the system does not immediately shutdown as expected or alarm as required, then remove the machine from service until the problem has been diagnosed and corrected.

MAINTENANCE

Review the Customer Safety Responsibilities section and follow the Testing & Commissioning instructions in this manual to insure that the sensor is working properly. You should develop a maintenance and inspection program to confirm that your system is in good working order at all times.

The personnel or person you select to install, operate, maintain, inspect or perform any work whatsoever, should be trained and qualified to perform these important functions. Complete and accurate records of the maintenance and inspection process should be created and retained by you at all times.

For questions regarding the safe operation and maintenance of any 4B product, contact 4B's technical support hotline at +1 309-698-5611.

PRODUCT WARRANTY

1. EXCLUSIVE WRITTEN LIMITED WARRANTY

ALL PRODUCTS SOLD ARE WARRANTED BY THE COMPANY 4B COMPONENTS LIMITED AND 4B BRAIME COMPONENTS LIMITED HEREIN AFTER REFERRED TO AS 4B TO THE ORIGINAL PURCHASER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE (1) YEAR AFTER DATE OF PURCHASE FROM 4B. ANY PRODUCT DETERMINED BY 4B AT ITS SOLE DISCRETION TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO A 4B BRANCH OR AUTHORIZED SERVICE LOCATION, AS 4B DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT 4B'S OPTION.

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3. NO WARRANTY "BY SAMPLE OR EXAMPLE"

ALTHOUGH 4B HAS USED REASONABLE EFFORTS TO ACCURATELY ILLUSTRATE AND DESCRIBE THE PRODUCTS IN ITS CATALOGS, LITERATURE, AND WEBSITES, SUCH ILLUSTRATIONS AND DESCRIPTIONS ARE FOR THE SOLE PURPOSE OF PRODUCT IDENTIFICATION AND DO NOT EXPRESS OR IMPLY A WARRANTY AFFIRMATION OF FACT, OF ANY KIND OR A WARRANTY OR AFFIRMATION OF FACT THAT THE PRODUCTS WILL CONFORM TO THEIR RESPECTIVE ILLUSTRATIONS OR DESCRIPTIONS. 4B EXPRESSLY DISCLAIMS ANY WARRANTY OR AFFIRMATION OF FACT, EXPRESSED OR IMPLIED, OTHER THAN AS SET FORTH IN THE EXCLUSIVE WRITTEN LIMITED WARRANTY STATEMENT ABOVE, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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With subsidiaries in North America, Europe, China, Asia, Africa and Australia along with a worldwide network of distributors, 4B can provide practical solutions for all your applications no matter the location.



4B BRAIME COMPONENTS LTD.

Hunslet Road
Leeds
LS10 1JZ
United Kingdom
Tel: +44 (0) 113 246 1800
Fax: +44 (0) 113 243 5021

4B DEUTSCHLAND

9 Route de Corbie
80800 Lamotte Warfusée
France
Tel: +49 (0) 700 2242 4091
Fax: +49 (0) 700 2242 3733

4B AFRICA

14 Newport Business Park
Mica Drive, Kya Sand
2163 Johannesburg
South Africa
Tel: +27 (0) 11 708 6114
Fax: +27 (0) 11 708 1654

4B FRANCE

9 Route de Corbie
80800 Lamotte Warfusée
France
Tel: +33 (0) 3 22 42 32 26
Fax: +33 (0) 3 22 42 37 33

4B COMPONENTS LTD.

625 Erie Avenue
Morton, IL 61550
USA
Tel: 309-698-5611
Fax: 309-698-5615

4B ASIA PACIFIC

Build No. 899/1 Moo 20
Soi Chongsiri, Bangplee-Tam
Ru Road, Tanbon Bangpleeyai,
Amphur Bangplee,
Samutprakarn 10540
Thailand
Tel: +66 (0) 2 173-4339
Fax: +66 (0) 2 173-4338

4B China

F1, Building 5A,
Jintong Industrial Park,
8 West Lake Road,
Wujin High & New TDZ,
Changzhou, Jiangsu, PRC
Tel: +86-519-88556006
Email: 4b-china@go4b.com

4B AUSTRALIA

Building 1, 41 Bellrick Street
Acacia Ridge
Queensland 4110
Australia
Tel: +61 (0)7 3216 9365
Fax: +61 (0)7 3219 5837



www.go4b.com